CRANKSHAFT FOR ELLIPTICAL EXERCISE MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to exercise apparatuses, and more particularly to a crankshaft for an elliptical exercise machine.

2. Description of the Related Art

A conventional elliptical exercise machine, as shown in FIG. 1, is composed of a frame 1, a driving wheel 2 disposed in front of the frame 1, two guide rails 3 extending rearwards from a distal end of the frame 1, two link bars 4 respectively fitted at bilateral sides of the driving wheel 2, and two foot support bars 5, each of which has an end pivotally connected with a foot support bar 5 and the other end slidably moved on a top side of the guide rail 3. Hence, it is easy for the user to perform pedaling exercise along an approximately elliptical trajectory by treading two pedals 6 mounted respectively on two top sides of the two foot support bars 5 and further enabling the foot support bars 5 to move together with the link bar 4. However, when the user treads the pedals 6 to operate the foot support bars 5, the user's ankles are confined by the foot support bars 5 that are integrally formed, such that the user can merely operate the foot support bars 5 upwards and downwards but leftwards and rightwards. Hence, the user fails to change angles at which the ankles apply strength, thereby causing operational inconvenience.

Referring to FIG. 2, another conventional elliptical exercise machine disclosed that a foot support bar 11 is provided with a bushing 13, a locking member 14, a stepped portion 12 formed at a front end thereof and mounted on a top side of the bushing 13 by inserting the locking member 14 through the stepped portion 12 to interconnect the

stepped portion 12 and the bushing 13 with each other, such that the foot support bar 11 can be operated to pivot sidewards. However, while the exercise machine is operated, the user's weight is supported only by the stepped portion 12, such that the intersection between the stepped portion 12 and the bushing 13 is subject to rupture or damage due to overstress for a long time. Therefore, the foot support bar of the exercise machine is structurally understrength to require improvement.

SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide a crankshaft for an elliptical exercise machine; the crankshaft is ergonomic in operation and is much strengthened in structure.

The foregoing objective of the present invention is attained by the crankshaft for the elliptical exercise machine. The elliptical exercise machine includes a frame, a stanchion, a driving wheel, two guide rails, two link bars, and two crankshafts. The stanchion and the driving wheel are mounted at a front side of the frame. The two guide rails are mounted at a rear side of the frame. The two link bars are respectively connected to two ends of an axle of the driving wheel to synchronously run together with the driving wheel. Each of the crankshafts is mounted on the frame and is pivotally connected with a distal end of the link bar, including a linking member, a foot support bar, and a slide member. Each of the linking members includes a head portion pivotally connected to the link bar to pivot with respect to the link bar, and a body portion disposed with a pivoting portion. Each of the foot support bars is mounted on the guide rail at a distal end thereof and has a pivoting part formed at a front section thereof. Each of the slide members is mounted between the pivoting portion of the linking member and the pivoting part of the foot support bar to be mounted in the pivoting part of the

foot support bar, such that the linking member, the foot support bar, and the slide member are pivotally connected with respect to one another. Accordingly, the crankshaft can be slidably moved on the guide rail to enable the user to perform an elliptical exercise and a slightly sideward pivoting, such that the present invention is not only operationally ergonomic but also much structurally strengthened.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a conventional elliptical exercise machine;

FIG. 2 is an exploded view of another conventional elliptical exercise machine;

FIG. 3 is a perspective view of a preferred embodiment of the present invention;

FIG. 4 is a partially exploded view of the preferred embodiment of the present invention;

FIG. 5 is a partially sectional view of the preferred embodiment of the present invention; and

FIG. 6 is a partially top view of the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 3 and 4, a crankshaft 31 constructed according to a preferred embodiment of the present invention is mounted on a frame 21 of an elliptical exercise machine 20 that includes a stanchion 22 and a driving wheel 24 both mounted in front of the frame 21, two parallel guide rails 25 mounted behind the frame 21, two link bars 28 respectively connected with two ends of an axle 26 of the wheel 24 for synchronous operation together with the wheel 24. The crankshaft 31 is pivotally

connected with a distal end of the link bar 28 to be guided by the wheel 24 to move for an elliptical trajectory. The crankshaft 31 is composed of a linking member 32, a foot support bar 35, and a slide member 38.

The linking member 32 includes a head portion 33, a body portion 34, a pivot hole 331 running through the head portion 33, and a pivoting portion 341 protruding upwards from the body portion 34. The linking member 32 is pivotally connected with the link bar 28 via the pivot hole 331 to pivot on the pivot hole 331 as an axis and with respect to the link bar 28.

The foot support bar 35 is tabular, including a pedal 36 mounted thereon for the user's foot treading, a pulley 37 mounted at a distal end of the foot support bar 35, and a pivoting part 351 formed at a front section thereof and having a receiving space inside and corresponding to the pivoting portion 341 of the linking member 32. The foot support bar 35 bends downwards at a rear section thereof to enable the pulley 37 to be slidably mounted on the guide rail 25 corresponding to the pulley 37 for being slidably moved on the guide rail 25.

The slide member 38 is mounted between the pivoting portion 341 and the pivoting part 351 and is columnar, having a through hole 381 axially running therethrough. The through hole 381 has an inner diameter slightly larger than an outer diameter of the pivoting portion 341 to enable the pivoting portion 341 to be inserted through the through hole 381. The slide member 38 has an outer diameter slightly smaller than an inner diameter of the receiving space of the pivoting part 351 to be mounted in the pivoting part 351 of the foot support bar 35. A bolt 41 is inserted through the linking member 32, the foot support bar 35, and the slide member 38 to pivotally interconnect the linking member 32, the foot support bar 35, and the slide member 38 with one another, such that the crankshaft 31 of the present invention is

formed.

Referring to FIGS. 5 and 6, when the linking member 32, the foot support bar 35, and the slide member 38 are pivotally connected with respect to one another, a gap H is formed between a front end of the foot support bar 35 and the head portion 33 of the liking member 32, such that the support bar 35 can pivot on the pivoting portion 341. When the support bar 35 pivots, two front corners J of the foot support bar 35 engage respectively against an outer periphery of the head portion 33 to confine a pivoting range/angle of the foot support bar 35. Hence, while the crankshaft 31 is operated, the crankshaft 31 can pivot slightly sidewards to become preferably ergonomic. The pedal 34 can share the user's weight on the foot support bar 35, such that the present invention can be much structurally strengthened.

In conclusion, the crankshaft of the present invention for the elliptical exercise machine is structurally simple and can pivot slightly sidewards to be operationally ergonomic and much structurally strengthened.